



Solid Edge Insight

*“A Microsoft SharePoint-Based Dedicated
Design Data Management Solution for
Solid Edge Communities”*

July 2010

A CIMdata Program Review

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Design Data Management Solution for
Solid Edge Communities”*

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*Produced by
CIMdata, Inc.*

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Solid Edge Insight

“A Microsoft SharePoint-Based Dedicated Design Data Management Solution for Solid Edge Communities”

This CIMdata-authored whitepaper reviews Siemens PLM Software’s Microsoft SharePoint-based design data management solution. The paper describes Solid Edge Insight and how it is a proven design-centric PLM solution focused on supporting Solid Edge communities. The paper also describes the value of this MS SharePoint-based solution for Solid Edge customers, and how the MS SharePoint platform enables them to leverage their existing IT infrastructure, and immediately benefit from the integration of design data and processes with their other business processes. A brief description of MS SharePoint is also provided. Additionally, the paper provides three Solid Edge Insight customer briefs. Each brief provides a description of the Solid Edge Insight customer, its Solid Edge Insight implementation, and value that they have received by using the solution.

1. Executive Summary

Solid Edge Insight (Insight) provides an integrated design management environment for users of the Solid Edge mechanical computer-aided design (MCAD) system. According to Siemens PLM Software (Siemens PLM), *Solid Edge Insight seamlessly integrates CAD, design management and web-based collaboration into a single tool that is easy-to-install and easy-to-maintain.* Insight, which is built on the Microsoft (MS) SharePoint platform, manages and leverages product information in a manner that has been designed to be unobtrusive and transparent. As Siemens PLM states, Insight provides “transparent design data management and improved collaboration for faster project completion.”

Companies that implement Solid Edge Insight should benefit from the following:

- *Low cost of implementation and use*—It is included as an integral component of Solid Edge; companies only need to implement or take advantage of standard Microsoft data sharing technologies.
- *Easy setup and administration*—A company does not have to spend time defining the database schema or configuring data management functions because the solution is preconfigured.
- *Simplified user training*—The introduction of Solid Edge design management capabilities is accomplished through familiar design workflows (i.e., familiar Solid Edge workflows).

- *Synchronized releases*—The Solid Edge and Insight release schedules are the same. Insight is embedded within the Solid Edge user environment.
- *Designed for growth*—Solid Edge Insight is compatible and fully-scalable with Siemens PLM’s Teamcenter software portfolio.
- *Proven track record*—Solid Edge Insight was first introduced in 2001 on top of Microsoft SharePoint.

Siemens PLM has designed Solid Edge Insight to benefit Solid Edge MCAD installations in their traditional market segments: mechanical machinery and equipment, electrical and electronic equipment, plant equipment layout and design, automotive components, and tooling for jigs and fixtures. Siemens PLM positions Insight as a design management solution that enables “Managed Design Collaboration” for Solid Edge design departments in firms that do not require full-featured, extensive, and more expensive PLM solutions and who have neither the time nor the resources to invest in such implementations. For manufacturing organizations that are already using SharePoint, Insight also delivers the ability to integrate design data and processes into their wider business processes.

Siemens PLM emphasizes that Solid Edge Insight is not a separate product. The integration of Microsoft Windows SharePoint Services and SQL Server—Microsoft .NET technologies—into the Solid Edge product architecture provides a design management capability across a Solid Edge installation. This includes significant Siemens PLM-

developed extensions that supplement Microsoft technology to provide Insight capabilities, e.g., product structure management support. Insight provides Siemens PLM with a competitive advantage in MCAD competitions for companies that require an integrated design management solution. Solid Edge Insight is integrated with Solid Edge and is sold through its traditional network of value added resellers (VARs).

Insight was first released in 2001 with Solid Edge Version 11 and as a result, has more than eight years of proven customer success (three brief customer reviews are included herein)—used by more than 1,000 customers and available to more than 400,000 Solid Edge users. The solution supports Windows SharePoint Services (WSS) 3.0, Microsoft Office SharePoint Server (MOSS) 2007, and SQL Server—Microsoft solutions commonly implemented by small- to medium-sized manufacturers. Siemens PLM reports that support for Microsoft SharePoint 2010 is planned for release later in 2010. Beyond this embedded Solid Edge data management solution, Siemens PLM also offers Insight Connect, a stand-alone, separately-priced, optional client for design data users who do not use Solid Edge. Insight highlights include:

- Data vault and document management functions that are based on SharePoint and MS SQL Server. Primary functions support document libraries, file check-in/out, full text search across multiple servers, user-definable attributes, and definition and management of multiple user roles.
- Solid Edge users can leverage SharePoint’s task management capability by linking Solid Edge documents to tasks. Managers can review and track task completion status.
- Full state-based design lifecycle management functionality that includes support for the six states traditionally provided by Solid Edge: available, in-work, in-review, released, baselined, and obsolete.
- Full support for product structure and BOM management and comprehensive revision control, including complete revision history tracking. The product structure and all associated relationships are stored in the SQL Server database making “where-used” functionality fast and efficient.

- Users can view parts, assemblies, drawings, and product structures with a standard web browser.
- Caching technology to both minimize network and server traffic when manipulating assemblies and to support the synchronization of offline design activities.
- Secure Links provide distributed data management capabilities and automatically update file paths and links.

In summary, the strength of the Insight solution is that it provides transparent and seamless Internet-enabled, collaborative design management functionality for Solid Edge users. The Solid Edge PathFinder is an integral part of the Solid Edge interface and displays the status of Solid Edge documents as managed by Insight. The PathFinder provides critical details like who has a document checked out and if it is the latest version/revision.

The research for this paper was sponsored by Siemens PLM Software.

2. Insight Background

The current release of Solid Edge Insight (Solid Edge Synchronous Technology 2 release) represents more than eight years of providing embedded data management capabilities to Solid Edge users. First released in 2001 with Solid Edge Version 11, Insight was one of the first

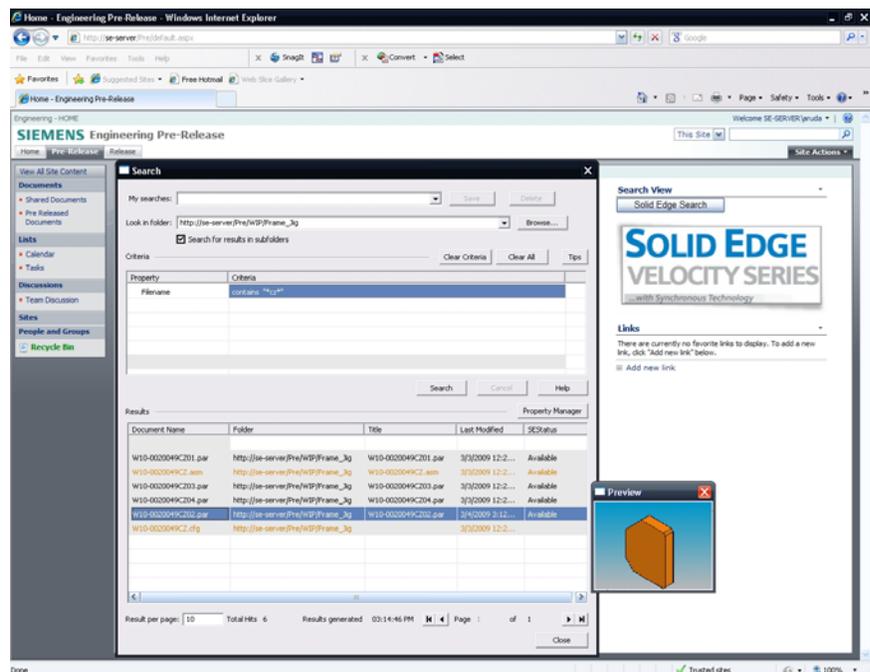


Figure 1—Solid Edge Insight’s Web Portal Search

SharePoint-based design data management solutions to be offered.

Solid Edge Insight’s development has been steady and consistent over the last eight years. When first introduced, Insight was built on SharePoint 2001, a relatively unproven data management platform, but one that held promise. In many ways, the first release represented a breakthrough that small- to medium-sized manufacturers were looking for—a data management solution that was embedded within their design environment running on Microsoft technologies and not UNIX. Initial functionality included open, check-out with property synchronization, save and edit profile, check-in with property synchronization, revise, Insight cache, add unmanaged content to SharePoint, and options (limited tailoring of the capabilities).

Releases 12 through 14 saw a number of client and server side functional and performance related enhancements. With the release of version 15, Siemens PLM brought to the market a significant number of Insight improvements, including Microsoft SharePoint Server 2003 support, SharePoint 2001 to 2003 migration support, performance-related enhancements, integration to PathFinder, and the Solid Edge Administrator. This was a significant upgrade for Insight since the underlying platform of SharePoint was moving from a MS Exchange data management core to one based on MS SQL Server. This was a positive move for Siemens PLM’s customers, and for Microsoft and the Insight solution. Version 15 introduced additional Insight Connect functionality, including create unmanaged copy and delete from Library capabilities, and for the Insight Server, Web Parts enhancements were introduced.

Siemens PLM’s steady pace of releases has been impressive. Since Insight’s first release in 2001, Siemens PLM has released ten new versions of the solution, many of which introduced significantly new functionality. For example, with version 19, full-text search, the indexing of annotation included on drawings, the expanded use of formulas (i.e., document formulas), and support for large-scale migrations were all introduced. With version 20,

Insight began to support 64-bit, enable action on Edit Profile capabilities, and where used on Revise (drawings). The Insight Server began to support Secure Server (https), and Insight Web Parts provided support for view as Exploded/List, select Family of Assembly Member, select Revision Rule, filter on relations, and a new search web part. Insight’s release cadence, and many of its new capabilities have been due, at least in part, to the additional capabilities being introduced in SharePoint.

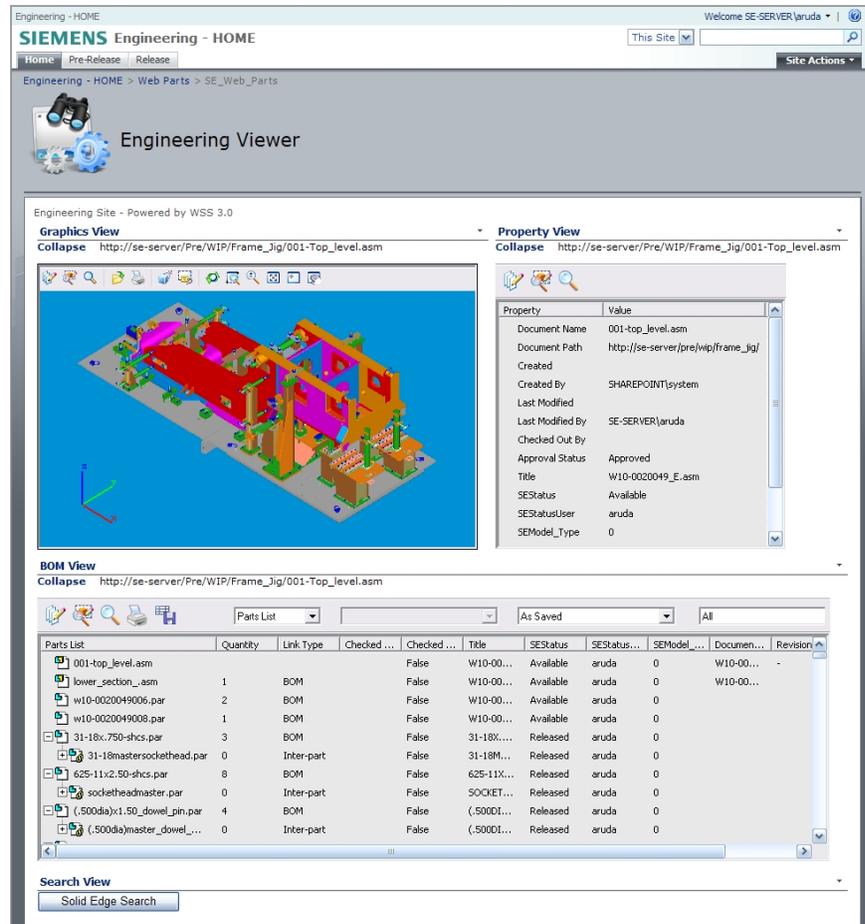


Figure 2—Solid Edge Insight’s Web Portal Assembly Viewer

Today’s solution (Solid Edge ST2) has come a long way. It represents a proven Solid Edge design-focused data management solution that leverages Microsoft’s Windows SharePoint Services (WSS) 2.0 and 3.0, Microsoft Office SharePoint Server (MOSS) 2003 and 2007, and SQL Server 2005 and 2008. A summary of its main capabilities is as follows:

- Secure vaulting of files and attribute data
- Document level security

Lincoln Electric

Lincoln Electric, headquartered in Cleveland, Ohio, was founded in 1895 and today is the world leader in the design, development, and manufacture of arc welding products, robotic arc-welding systems, plasma, and oxyfuel cutting equipment and has a leading global position in the brazing and soldering alloys market. Lincoln has 37 manufacturing locations, including operations and joint ventures in 18 countries and a worldwide network of distributors and sales offices covering more than 160 countries. Globally, the Company has a work force of approximately 9,000, with the vast majority of its research and development, and engineering-to-order work being supported by its employees located in its Cleveland facilities.

Lincoln Electric has been a long-term customer of Siemens PLM Software's design-focused mechanical CAD tool, Solid Edge. They migrated to Solid Edge in 1997-8 from EMS, a previous 3D solution of Intergraph—the original development organization of Solid Edge. According to Jim Srnick, Lincoln Electric's CAD/PDM Systems Administrator, Lincoln Electric realized early in its use of Solid Edge that a product data management (PDM) solution was required. Initially, Lincoln pursued the selection and implementation of an enterprise PDM solution to manage its CAD models and associated development processes, but after five years they decided to take a CAD data management focused approach and implemented in 2006 Solid Edge Insight to manage its Solid Edge environment. According to Mr. Srnick, with this new approach they quickly realized the appropriate level of data and process control they needed at a much lower cost than they previously encountered.

Today, Mr. Srnick reports that all of Lincoln Electric's Solid Edge users make use of Insight on a daily basis to manage their design deliverables, the majority of which are located in Cleveland, with a few additional remote designers. Additionally, individuals also have viewing access to Insight managed data. These individuals primarily use PCF functionality and Insight Connect to search and review Insight managed data.

Mr. Srnick reports that the Insight users are extremely happy with the tool and its capabilities, especially its search tool's performance. Considering the large quantity of managed data, the ability to quickly find the appropriate design and associate information is critical. Mr. Srnick reports that Insight has allowed Lincoln Electric to organize their CAD data and people in a much more efficient manner than they were able to previously. Additionally, the integration with Solid Edge is seamless, thereby allowing the CAD designers to focus on designing and not on data management tasks, e.g., check-in and check-out are automatic, and the Solid Edge links are managed without user intervention. Fundamentally, according to Mr. Srnick, Insight has provided them the level of data management that they need, at a very low total cost of ownership.

- Fast searches with graphical preview
- Check-in/Check-out with automatic versioning
- Where used capability for impact analysis
- Data management operations embedded into Solid Edge dialogs
- Revision filters when opening assemblies
- Browse database from Solid Edge
- See status of other parts in the open assembly
- Integrated revision and release management
- View and Markup utility
- Revision Manager to create new revisions outside of Solid Edge
- Life Cycle Assistant utility for release management
- Web portal for wide access

Solid Edge Insight's next release is scheduled for the end of 2010. Besides a number of performance and functional enhancements, it is slated to support MS SharePoint 2010. This of course is dependent upon Microsoft delivering

according to schedule—herein illustrates one of the issues with regard to leveraging someone else's technology platform. Fortunately, Siemens PLM has a long history of working with Microsoft and aligning its development strategies and timing so that it can take full advantage of the much larger development organization that works for Microsoft.

2.1 Solid Edge Background

Solid Edge, from Siemens PLM Software, is one of the leading design-focused mechanical CAD (MCAD) software products on the market today. Built on the Parasolid kernel, Solid Edge is popular for use in designing machinery, electro-mechanical devices, consumer products, and tooling industries, amongst others. While categorized as a design-focused MCAD solution, Solid Edge can manage very large assemblies—greater than 200,000 parts. Solid Edge is assembly-centric and workflow-oriented, and provides efficient commands for common design tasks. Its Windows-centric design provides a familiar user interface making it

easy to learn and use. This makes it easier for companies to achieve the benefits of moving to 3D design.

Seat installations for Solid Edge range from one to several hundred resulting in a wide range of PDM requirements. For example, smaller customers' needs focus on vaulting and searching, while larger customers may also focus on workflow and project management. Basing Solid Edge Insight on SharePoint has enabled Siemens to meet the needs of this wide range of customer profiles.

2.2 Market Position and Program Strategy

Siemens PLM emphasizes that Insight is not a standalone product. They position Insight as a preconfigured embedded design data management solution built on Microsoft's SharePoint platform for Solid Edge customers. According to Siemens PLM Software (Siemens PLM), *Solid Edge Insight seamlessly integrates CAD, design management, and web-based collaboration into a single tool that is easy to install and easy to maintain.* Simply stated, Insight has been designed to allow the sharing of information via the Internet while maintaining control; thereby assuring availability, accuracy, currency, and integrity of a company's intellectual assets (i.e., its product definition information).

For users of Solid Edge Insight, the benefits can be significant. They include the ability to:

- Find product data faster as a result of quicker metadata searches and file retrieval mechanisms provided by SharePoint.
- Effectively manage collaboration and communication as a result of design access control and the incorporation of 2D/3D view & markup, and BOM structure viewing tools.
- Capture and re-use design data throughout the product development lifecycle.
- Understand the true impact of proposed product changes through the incorporation of "where-used" functionality and comprehensive version/revision control.
- Guarantee that the correct design is released through the automation of tasks via the embedded workflow engine.
- Protect the company's intellectual assets by assuring that they are retained, secure, and reliable.

Solid Edge Insight allows Solid Edge customers to manage collaboration by supporting the asynchronous collaborative requirements of a typical Solid Edge installation including all the requirements of non-CAD users who need to visualize and markup the design data in a controlled environment.

According to Siemens PLM, Insight is easy to implement and use, in contrast with more complex, traditional PLM solutions that have been architected for large global deployments. A major message is that users require little, if any training to be able to use Insight since it is embedded within Solid Edge and uses standard Solid Edge user interface functions. Insight Connect, the interface for non-CAD users, is also easy to use since it is delivered through a Microsoft Internet Explorer portal that takes advantage of a number of common graphical user interface (GUI) techniques that have become broadly understood because of wide use of the Internet.

Siemens PLM has designed Insight for Solid Edge MCAD design departments in firms that do not require full-featured, extensive, and more expensive PLM solutions and who have neither the time nor the resources to invest in such

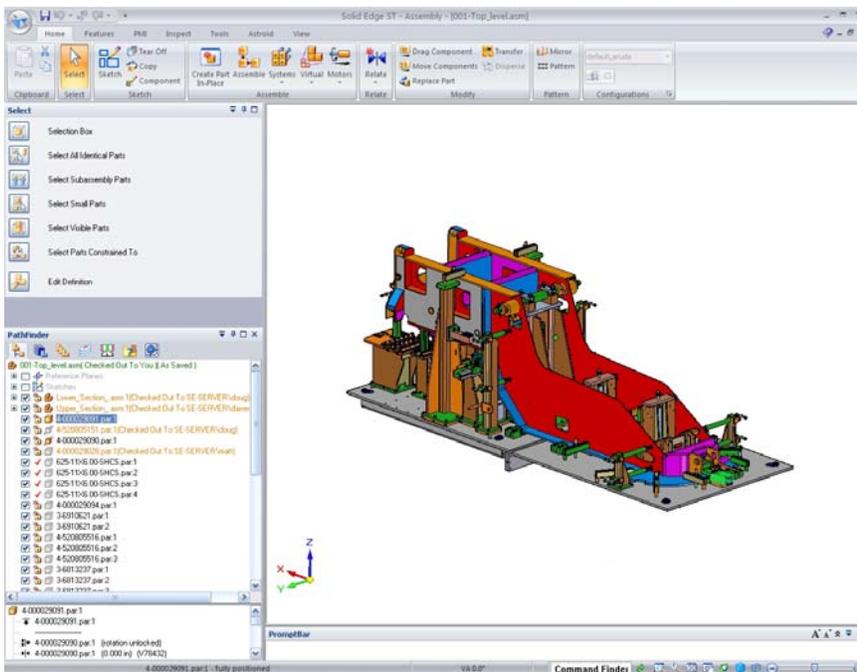


Figure 3—The Pathfinder dialog within Solid Edge shows the status of all parts as managed by Insight

implementations. Industries targeted include: mechanical machinery and equipment, electrical and electronic equipment, plant equipment layout and design, automotive components, and tooling for jigs and fixtures. Fundamentally, Insight is a design management solution for Solid Edge environments where an extended enterprise PLM solution such as Teamcenter is not required.

2.3 Marketing, Sales, and Support Programs

Solid Edge is sold through a large, international network of value-added resellers. Solid Edge also collaborates with Siemens PLM's technology partners, who add value to the Solid Edge MCAD solution by providing solutions ranging from specialized design and analysis applications, standard parts libraries, and sheet metal manufacturing design tools.

As with other Siemens PLM products, Solid Edge Insight is being promoted through a number of different mechanisms, including customer case studies, advertisements in various industry publications, road shows, and other seminar events. Since Insight is included with Solid Edge it is delivered to all customers through their global network of Value Added Resellers (VARs) who are trained to promote, implement and support this solution.

2.4 Development Program

The initial need for Solid Edge Insight came from the design management issues faced by Solid Edge users. By basing their solution on Microsoft SharePoint, Siemens PLM was able to speed the solution's initial introduction, and provide a natural integration with users' everyday Windows-based desktop environment. In subsequent releases, Siemens PLM has demonstrated its ability to continue to capitalize on Microsoft Windows SharePoint Services and the additional capabilities subsequent releases of the platform have provided.

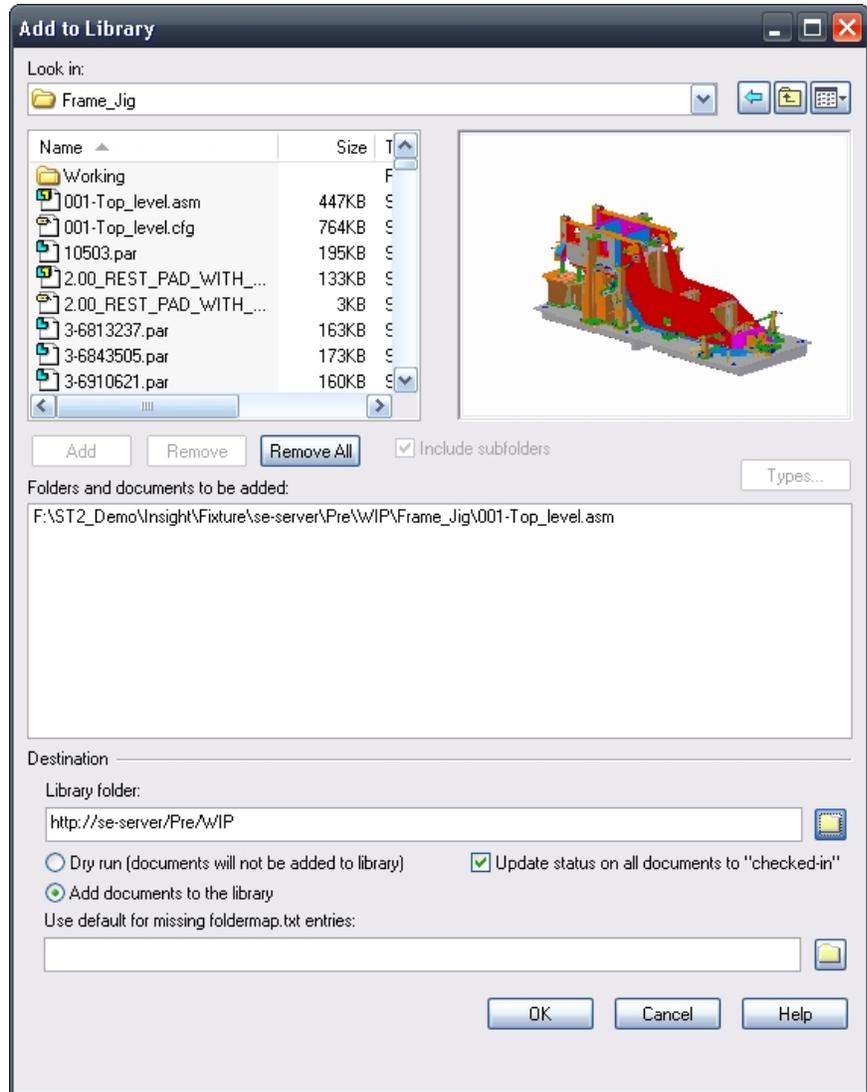


Figure 4—“Add to Library” enables bulk loading of existing Solid Edge data into Insight

Solid Edge Insight is not packaged as a separate product. Rather, it is an integration of Microsoft Windows SharePoint Services and Microsoft SQL Server—within Solid Edge, with significant Siemens PLM-developed capabilities that have extended the platform's data management capabilities (e.g., Siemens PLM has developed a set of Web Parts that extend SharePoint's capabilities). This added functionality primarily supports Insight's product structure management capabilities—assembly structure, BOM, links, and relationships.

The Insight solution runs on Windows XP, Windows Vista, and Windows 7 operating systems, both 32- and 64-bit versions, and assumes that the client organization has a

Microsoft Windows Server infrastructure in place. To view the Insight Dashboard, users need Microsoft's Internet Explorer 6.0 or later.

With the MS Windows 2008 Server edition, companies receive Windows SharePoint Services (WSS). WSS provides the browser, document management functions, and a full set of administrative tools. No separate web server is required. Microsoft SQL Server 2008 is SharePoint's database engine responsible for the storage and management of all metadata—attributes, file properties, part properties, and non-graphic data (e.g., lists). The solution also includes Insight Connect; a stand-alone, separately-priced client for non-CAD users who wish to review and manage Solid Edge data. This client does not require a Solid Edge license and is typically used by design

office administrators and design department managers. It supports revision management, release management, view and markup, and reporting functions. Insight Connect users can edit metadata, but not geometry.

Insight releases have been synchronized with Solid Edge release since inception. Over the long-term Siemens PLM expects the release cycle for Solid Edge to be every nine months, with the next release (ST3) planned to take place at the end of 2010—at this time Insight will support Microsoft SharePoint 2010.

3. Insight Market Position

Since its introduction in 2001, Solid Edge Insight has steadily gained a solid presence among Solid Edge

SPÄNEX

SPÄNEX, headquartered in Uslar, Germany, develops, manufactures, distributes, services, and maintains chip- and dust-extraction and filter plants, and large filter units as well as small mobile units that do the same. For disposal of the chip material, SPÄNEX produces briquetting presses and warm-air stoves. SPÄNEX products are mainly used in the wood processing industry as well as the plastic-, paper-, and metal-processing industries. The SPÄNEX sales and distribution network provides global coverage, but the majority of business is in Central Europe.

SPÄNEX plant-scaled products are designed and built-to-order by its approximate 60 employees at a rate of 100-150 units per year. The mobile units generally consist of 60-70% standard components and modules, with the rest representing customer-specific modifications. Less than 1,000 mobile units are delivered annually. Once in operation, SPÄNEX products last for a long time (in some cases more than 30 years). SPÄNEX proudly supports all of their operational products in the field.

According to Mr. Nörtemann, Technical Manager at SPÄNEX, Solid Edge Insight was selected from a number of solutions that had been under consideration for two years. The decision was made for the full package: a 3D CAD system and integrated data manager. The criteria used included:

- The solution needed to come with a database that is owned by the solution supplier.
- Confidence in service and support capabilities and standards of the solution supplier.
- Future growth path from a corporate roadmap point of view (e.g., migration to Teamcenter would be easy).
- Microsoft support and integration was a pre-condition.
- Simple changeover from 2D to 3D.

Mr. Nörtemann reported that only 2-3 months after their decision to select Solid Edge Insight, the solution was operational. Most of the time went into programming their libraries and populating the database. The difficult part of this task was to decide the structure of the library (i.e., so that it would be future-proof), and to find the time to populate the database. Mr. Nörtemann further stated that while the company is still in their early days of working with the solution, and the solution is not yet being utilized to its full extent, they already have experienced a number of improvements, including:

- Seamless revisioning of structures and parts
- Changes are made a lot easier than before
- Re-use is a lot easier and faster

Mr. Nörtemann also stated that SPÄNEX is happy with the selection made and they have confidence that the solution, as part of a total portfolio of PLM solutions from Siemens PLM, will enable them to expand their data management environment well into the future and keep it in synch with their corporate roadmap.

customers. Today, Siemens PLM reports that Insight is being used by more than 1,000 Solid Edge customers including Reading Bakery, Link Belt, SLAC, Lincoln Electric, Jiangnan Jiajie Elevator, SPÄNEX, Tomcar, MacDon, Thomas Instrument Winterwarm, Scanimix, Toshiba Komukai, and Spaenex.

Solid Edge Insight is embedded with the Solid Edge Classic license and can be purchased as an add-on for other Solid Edge license levels—for example, Solid Edge Foundation. Siemens PLM reports that about 250,000 Classic Solid Edge seats have been enabled with Insight—about 60% of them are European-based customers. Over the years, Insight clearly has gained momentum within the Solid Edge-installed based and has been viewed by many as an important and visible component of Siemens PLM’s mid-market solution offering—Velocity Series. The Velocity Series is a set of preconfigured and easy-to-deploy design, manufacturing, and data management solutions—Solid Edge and Solid Edge Insight are both components of the offering.

Overall, CIMdata expects Insight’s adoption rate to increase as small- to medium-sized businesses implement Microsoft’s underlying platform—SharePoint—and gain a better understanding of the value of design data management. At this point, it appears that many large users of Solid Edge have installed Insight, while probably a reasonable number of customers with fewer than five seats have not.

4. Insight Design Data Management Capabilities

Solid Edge Insight offers a robust set of design data management-focused functionality specifically tailored to support Solid Edge MCAD installations. Building their solution on top of a commercial Microsoft platform has allowed Siemens PLM to leverage the power of the world’s largest PC software development firm. Users report that Insight provides “invisible PDM” that resides within their MCAD environment. Current Solid Edge users with the proper Windows infrastructure need only a dedicated server and the necessary SQL Server licenses, a small bill when compared to installing many other PLM solutions.

While this solution should be beneficial for both current and prospective Solid Edge users, it is aligned with organizations that are committed to a Microsoft .Net technology strategy since it relies on Microsoft’s SharePoint technology to provide much of its underlying architecture. It should be noted that any potential risk of SharePoint not being supported by Microsoft in the future

was greatly minimized as a result of Microsoft’s incorporation of SharePoint a few years ago into the core of its Windows 2003 Server product.

As mentioned previously, Solid Edge Insight is focused on supporting Solid Edge users. As a result, it was not designed to be a full-featured PLM solution, but rather an “out-of-the-box” design data management solution that is quick to implement, use, and is easily integrated into an organization’s .NET technology environment. Insight’s main capabilities include:

- *Secure vaulting with check-in/check-out*—Solid Edge Insight manages product data (e.g., files and associated information records) in organized workspaces that makes it easy to find and re-use data. This information is protected with secure vaulting, role-based access, document level security, check-in, check-out, rapid search, where-used, and other design management tools.
- *Comprehensive access control through configurable user roles*—Companies can easily assign roles for each user of product data and establish rule-based access to design data (e.g., drawings, models, and documents). A user can be a member of more than one group and membership can change to suit different projects.
- *Revision management*—Solid Edge uses Insight to control versions and revisions of managed data.
- *Design release management*—From pre-released to released, and throughout any change notices that occur afterward, Insight manages the design process so that changes can be enacted, checked, and approved. The Lifecycle Assistant can be used by non-Solid Edge users to release Solid Edge parts, assemblies, and drawings in a pre-defined and controlled way.
- *CAD product structure management and BOM creation*—Solid Edge assembly structures are automatically captured by Insight and made available to users through the web portal in a familiar Bill of Materials format. Insight automatically manages these BOMs that define the physical product and drive many other business processes. BOM data can be extracted and output in XML format for incorporation into ERP and other corporate systems.
- *Rapid searches and “where-used” reporting*—The ability to evaluate the impact of design decisions by quickly searching and finding all managed data that will be affected by a change, including all related 2D drawings. Within the standard Solid Edge file opening operation, designers can use an embedded search tool to locate design data by any defined criteria. In addition, powerful “full text” searches can

be run to locate specific text within Solid Edge documents including notes placed on drawings.

- *Task and workflow management*—Task and workflow capabilities provided by SharePoint are fully exposed to Insight users. This allows them to manage daily tasks and to implement additional workflows to support company-specific processes.
- *Web portal for wider access to design data*—Insight leverages Microsoft SharePoint’s collaborative technologies to provide a web portal for viewing 2D and 3D designs with managed access to associated data.
- *Offline mode with synchronization on reconnection*—Insight allows Solid Edge users to add value to managed designs when disconnected from their design network. Changes made are then synchronized when a user reconnects to their design network.
- *Insight Connect*—A standalone Insight client that provides access to additional utilities including View and Markup, Life Cycle Assistant (for release management), Revision Manager, and Add to Library. It is typically used by engineering managers and design office administrators to analyze and markup designs, start new design projects, and release designs to manufacturing.

As previously mentioned, Insight has been designed to provide transparent design data management capabilities to Solid Edge users. Siemens PLM has accomplished this by embedding a number of key data management functions in Solid Edge’s file related commands, e.g., Open & Save are Insight-enabled and automatically manage check-in and check-out functions. A few key functions and design data management-focused enhancements delivered by this release of Insight include:

- Performance improvements for opening assemblies with inter-part links
- Assembly tasks such as replace part, save as, and revise are supported
- The Assembly Pathfinder displays status of assembly components
- The Solid Edge file status is visible throughout the release process

Finally, it should be mentioned that Siemens PLM offers the XpresReview solution for improved collaboration with external users such as suppliers and customers. This downloadable solution, which is free, can be used to view, analyze, and markup Solid Edge documents that are published using Insight Connect.

5. Insight: An MS SharePoint-based Solution

Solid Edge Insight is based on Microsoft SharePoint—as Microsoft states, “*the business collaboration platform for the enterprise and the Internet.*” Insight, an early SharePoint adopter, leverages this Microsoft .NET application platform to enable users to work together on documents, tasks, and projects in a collaborative team environment. Microsoft designed this environment for easy and flexible deployment, administration, and application development.

5.1 History

SharePoint grew out of several efforts Microsoft had underway in the 1990s that targeted information access and sharing. In many ways, the adoption and growth of the Internet as an information sharing platform was a driver for Microsoft’s SharePoint related plans.

According to Jeff Teper, Corporate Vice President, MS SharePoint Server, as he describes on the official blog of the Microsoft SharePoint Product Group, Microsoft did a lot of research around the world as part of the planning of what became SharePoint V1. Through this research, it became clear there was an opportunity to help both end users and IT be more efficient and effective.

According to Mr. Teper, at the beginning there were two SharePoints, which evolved from projects codenamed “Office Server” and “Tahoe” around the Office XP development cycle. “Office Server” evolved out of the FrontPage, and Office Server Extensions and “Team Pages,” and targeted simple, bottoms-up collaboration. “Tahoe” was built on shared technology with Exchange and the “Digital Dashboard” and was targeted at top-down portals, search, and document management.

Mr. Teper comments that on the platform side, Microsoft was making a very fundamental bet on Web Services including collaborating with vendors across the industry on the evolution of XML, SOAP, and much more. Microsoft saw that this, and the increased maturity and scalability of SQL Server, would give SharePoint a foundation for highly-scalable web-based solutions. On the application side, Microsoft was hearing that customers wanted Office to go beyond personal productivity to organizational productivity and, as a result, Microsoft had to decide whether it would invest in content management, portals, unified communications, business intelligence, and many other new scenarios.

Thomas Instrument

Thomas Instrument, located in Brookshire, Texas, is a provider of engineering, manufacturing, repair, and overhaul services to the United States Department of Defense (DoD). In addition to their main site in Brookshire, Thomas Instrument, which has been certified to the AS9100B standard, has satellite manufacturing and engineering facilities near major DoD logistics centers throughout the U.S. The company is mainly used by the DoD to produce and/or support parts, components, and systems that are no longer produced and/or supported by the original equipment manufacturer (OEM). This support is provided by their team of engineers and designers who are distributed across 3 main sites.

Mr. Dwayne Anders, Thomas Instrument's IT Manager, reports that Thomas Instrument is currently utilizing sixteen seats of Solid Edge within their design environment. These seats, which are spread across the organization's main 3 sites, are all managed by Solid Edge Insight. According to Mr. Anders, Thomas Instrument has been using Solid Edge since the 2003-4 timeframe. Mr. Anders reports that they initially installed a few seats without any CAD data management capabilities, but as they grew their design environment, both in the number of Solid Edge seats as well as other CAD tools, they quickly realized the need for a design-focused data management solution. They initially tried another solution, but found its integration to CAD to be somewhat lacking. So in early 2009, they implemented Solid Edge Insight. At the time they felt that it supported the vast majority of their requirements at a very low cost of ownership. According to Mr. Anders, their understanding has proven to be accurate.

Mr. Anders reports that Insight's support of SharePoint has proven to be beneficial for Thomas Instrument. It has allowed them to tune their wide area network specifically for SharePoint. This tuning allows them to accelerate the transfer of SharePoint managed data across their sites. In support of Insight, they currently run SharePoint 3.0 and the SQL Server 2005 database at their main office. Additionally, Mr. Anders reports that the Insight Connect solution is used inside the document control department and manufacturing. Insight was their first implementation of SharePoint, but because of its ease of use they have already extended it and set up another site to support a different area of the business.

Thomas Instrument has used Insight to streamline their revision control and associated design data management processes. According to Mr. Anders, this has resulted in improved Workflow of their engineering and design tasks and improved visibility, e.g., users know who is editing any given design. Mr. Anders says that their current environment is light years ahead of where they were before. While Thomas Instrument is extremely happy with the current capabilities provided by Insight, they are already looking at and communicating with Siemens PLM the areas where it could be enhanced. For example, they would like Insight to automatically notify the appropriate users when a specific document is in the midst of being revised, and they would like additional automation enabled (e.g., the generation of PDFs).

According to Mr. Teper, "The entire Office team had SharePoint as a vision pillar and we designed the user experience, architecture, extensibility, in a more holistic way than we had done in the previous release." As the development moved forward, Microsoft evolved STS into a more scalable and flexible platform, and built SPS on top of it. Mr. Teper comments, "At this point, we also knew that customers, partners, and Microsoft would be hosting SharePoint on the Internet and we made a lot of core investments in role-based delegation, partitioning, stateless front-ends, etc. to enable this. These architecture bets enabled us to ultimately offer SharePoint Online to both dedicated and multi-tenant customers in the 2007 release." As a result of this development, SharePoint Portal Server 2003 was built on top of Windows SharePoint Services V2.

As with most Microsoft software solutions, the development didn't stop with the V2 release. Microsoft learned, as described by Mr. Teper, that "As customers put more content in SharePoint and built more sites with it, we

got a lot of requests to take this to the next level—more formal processes, more oversight, and more sophisticated web publishing. Building on the new Microsoft platform technologies such as Windows Workflow and Windows Right Management, we also invested document and records management across the server and client. One of the biggest sources of feedback in 2003 was the relationship between SPS and our Content Management Server (CMS) 2002 web-publishing product that was used by a lot of Internet sites. The teams came together and proposed a shared experience and architecture that was one of the highlights for 2007. Complementing content management, we increased our search depth with a focus on new relevance algorithms and innovative people and business data search. Finally, to enable customers to build business process integration and business intelligence portals, we added Excel Services and InfoPath Forms Services." Siemens PLM, like other software developers who chose to leverage SharePoint, has worked closely with Microsoft—providing them input, learning from collaborative work sessions,

reviewing SharePoint enhancement plans, talking with other developers, etc. Today, SharePoint is a proven platform with more than 100 million licenses, 17,000 customers, 325,000 portals, sites, and subsites, and more than 3,400 partners delivering capabilities on it. Its success across all businesses including small- to medium-sized manufacturers has been impressive. According to an October 19, 2009 Microsoft press release, SharePoint Server is one of the fastest-growing products in the company's history, with over \$1.3 billion in revenue, representing more than 20% growth over the past year.

5.2 Main Capabilities

According to Microsoft, SharePoint 2010, the newest release of the platform, has been designed to provide the following main capabilities:

- *Sites*—provides a single infrastructure for an organization's business websites. Share documents with colleagues, manage projects with partners, and publish information to customers.
- *Communities*—delivers a set of collaboration tools and a single platform to manage them. This capability is designed to allow people to share ideas and work together the way they want.
- *Content*—allows compliance measures to be set up “behind the scenes” with features like document types, retention policies, and automatic content sorting, allowing people to work naturally from within their Microsoft Office environment.
- *Search*—a combination of relevance, refinement, and social cues are included that are designed to help people find the information and contacts they need to get their jobs done.
- *Insights*—gives everyone access to the information in databases, reports, and business applications.
- *Composites*—provides tools and components for creating do-it-yourself business solutions.

As evident from SharePoint's history and current list of capabilities, Microsoft has clearly invested a significant amount of resources into the solution. As a key component of its .NET architecture, CIMdata expects Microsoft to continue its high level of investment for the foreseeable future.

5.3 Benefits

There are a number of benefits that an industrial organization implementing the SharePoint-based Solid Edge Insight design data management solution can realize. These include:

- *Increased organizational productivity*—Insight provides only one interface to learn, providing transparent design data management from within the Solid Edge environment. Workflows, tasks, and notification capabilities improve efficiency of cross department processes.
- *Wider access to design data in a managed environment*—Insight's SharePoint-based architecture maintains security of design data throughout its lifecycle and the SharePoint web portal provides wide access to the managed data. Users can search for and view assemblies, parts, and drawings, check release status; view Solid Edge BOMs and create parts lists; and create, view, and update design tasks.
- *Reduced IT support expenses*—Insight provides IT with a single platform and an integrated set of technologies to manage. It also reduces end-user support requirements. Additionally, SharePoint's underlying database, Microsoft SQL Server, provides a secure and scalable design management vault that uses familiar performance and administrative tools for backup and recovery.
- *Reduced IT expenditures*—Insight requires Windows SharePoint Services, which is included with Windows Server 2003 and 2008—a software product that most IT departments already own because of its content management, enterprise search, forms, and business intelligence capabilities.
- *Reduce IT integration complexities*—SharePoint, ERP, and other enterprise systems can be easily integrated with Insight.

As illustrated by these multi-dimensional benefits, Solid Edge Insight can provide an organization that utilizes Solid Edge with a measureable return on investment.

6. Conclusion

Solid Edge Insight is a proven design-centric Product Lifecycle Management solution focused on supporting Solid Edge communities. Siemens PLM has a long list of customers who have implemented and benefited from using Solid Edge Insight.

By building their solution on top of a commercial Microsoft SharePoint platform, Siemens PLM is able to deliver to market a strong set of PLM functionality without having to develop and prove a new architecture. For Solid Edge customers, the MS SharePoint platform enables them to leverage their existing IT infrastructure and immediately benefit from the integration of design data and processes with their other business processes.

A key strength of the Insight solution is that it is fully embedded within the Solid Edge application and provides transparent and seamless design management functionality for managed collaboration.

Siemens PLM continues to make significant enhancements to Insight that leverage the latest MS SharePoint capabilities to deliver wider PLM capabilities and improved collaboration across the customer's organization, as well as with their suppliers and customers.

About CIMdata

CIMdata, a leading independent worldwide firm, provides strategic consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM) solutions. Since its founding more than 25 years ago, CIMdata has delivered world-class knowledge, expertise, and best-practice methods on PLM solutions. These

solutions incorporate both business processes and a wide-ranging set of PLM enabling technologies.

CIMdata works with both industrial organizations and suppliers of technologies and services seeking competitive advantage in the global economy. In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education through PLM certificate programs, seminars, and conferences worldwide. CIMdata serves clients around the world from offices in North America, Europe, and Asia Pacific.

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